Amendments to the Claims:

1-29. (canceled)

30. (Previously Presented) A multiple-input multiple-output (MIMO) radio transceiver on a single semiconductor integrated circuit, comprising:

a receiver comprising at least first and second receiver circuits each configured to process a signal from a corresponding one of first and second antennas, the first receiver circuit configured to downconvert a first receive signal detected by the first antenna to produce a first baseband signal, the second receiver circuit configured to downconvert a second receive signal detected by the second antenna to produce a second baseband signal;

a transmitter comprising at least first and second transmitter circuits, the first transmitter circuit configured to upconvert a first baseband transmit signal to generate a first radio frequency signal that is coupled to the first antenna for transmission, the second transmitter circuit configured to upconvert a second baseband transmit signal to generate a second radio frequency signal that is coupled to the second antenna for transmission;

a first power amplifier configured to amplify the first radio frequency signal;

a second power amplifier configured to amplify the second radio frequency signal;

a first filter shared by the first transmitter and first receiver circuits; and

a second filter shared by the second transmitter and second receiver circuits.

31. (Previously Presented) The radio transceiver of claim 30 further comprising:

a local oscillator coupled to the receiver and to the transmitter, the local oscillator configured to supply a local oscillator signal to each of the first and second receiver circuits used to downconvert the first and second receive signals, respectively, and supply a local oscillator signal to each of the first and second transmitter circuits used to upconvert the first and second baseband transmit signals, respectively, to a desired frequency for the first and second radio frequency signals, respectively.

32. (Previously Presented) The radio transceiver of claim 31, wherein the first receiver circuit and the second receiver circuit are configured to process the first and second receive signals substantially simultaneously to allow for combining of signals resulting from the processing by the first and second receiver circuits.

33. (Previously Presented) The radio transceiver of claim 31, wherein the first transmitter circuit and the second transmitter circuit are configured to process the first and second baseband transmit signals for transmission of the corresponding first and second radio frequency signals substantially simultaneously.

34. (Previously Presented) The radio transceiver of claim 30 further comprising:

a frequency synthesizer configured to produce a local oscillator signal that is coupled to each of the first and second receiver circuits to be mixed with the first and second receive signals, respectively, wherein the local oscillator signal may

be at any frequency within one or more discrete radio frequency bands to receive the first and second receive signals at a common frequency, and wherein the frequency synthesizer is configured to generate a local oscillator signal that is coupled to the first and second transmitters to up-mix the first and second baseband transmit signals, respectively, for transmission of the corresponding first and second radio frequency signals at a common frequency within the one or more radio frequency bands.

35. (Previously Presented) The radio transceiver of claim 30, wherein the first and second receiver circuits comprise a single stage mixer configured to downconvert the first and second receive signals directly to baseband.

36. (Previously Presented) The radio transceiver of claim 30, wherein the first and second receiver circuits comprise a two stage mixer configured to downconvert the first and second receive signals to first and second intermediate frequency signals at a common intermediate frequency, and then to first and second baseband signals.

37. (Previously Presented) The radio transceiver of claim 36 further comprising:

a frequency synthesizer configured to supply a radio frequency local oscillator signal and an intermediate frequency local oscillator signal to the first and second receiver circuits, wherein the intermediate frequency local oscillator signal is derived from the radio frequency local oscillator signal by a division ratio.

38. (Previously Presented) The radio transceiver of claim 30 further comprising:

a first power amplifier in the first transmitter circuit configured to amplify the first radio frequency signal and a second power amplifier in the second transmitter circuit configured to amplify the second radio frequency signal.

39. (Previously Presented) The radio transceiver of claim 30, wherein each of the first and second receiver circuits comprises a radio frequency mixer configured to down-mix the first and second receive signals, respectively, to an intermediate frequency signal, and a pair of quad mixers configured to down-mix the intermediate frequency signal to in-phase and quadrature baseband signals.

40. (Currently Amended) The radio transceiver of claim 30, ~~wherein~~ further comprising:

~~the~~ a first interface is configured to filter either the first baseband transmit signal that is output to the first transmitter circuit or to filter the first baseband signal produced by the first receiver circuit~~,~~; and

~~the~~ a second interface is configured to filter either the second baseband transmit signal that is output to the second transmitter circuit or to filter the second baseband signal produced by the second receiver circuit.

41. (Previously Presented) The radio transceiver of claim 30, wherein the first receiver circuit comprises first and second radio frequency mixers, wherein the first radio frequency mixer is configured to down-mix the first receive signal to an intermediate frequency signal on a condition that the first receive signal is in a first radio frequency band and the second radio frequency mixer is configured to down-mix the first receive signal to an intermediate frequency signal on a condition that the first receive signal is in a second radio frequency band, and wherein the second receiver circuit comprises first and second radio frequency mixers, wherein

the first radio frequency mixer is configured to down-mix the second receive signal to an intermediate frequency signal on a condition that the second receive signal is in a first radio frequency band and the second radio frequency mixer is configured to down-mix the second receive signal to an intermediate frequency signal on a condition that the second receive signal is in the second radio frequency band.

42. (Previously Presented) The radio transceiver of claim 41, wherein the first receiver circuit further comprises a pair of quad mixers coupled to the output of the first and second radio frequency mixers and configured to further down-mix the intermediate frequency signal to the first in-phase and quadrature baseband signals representative of the first receive signal, and the second receiver circuit further comprises a pair of quad mixers coupled to the output of the first and second radio frequency mixers and configured to further down-mix the intermediate frequency signal to the second in-phase and quadrature baseband signals representative of the second receive signal.

43. (Previously Presented) In combination, the radio transceiver of claim 30, and a radio front-end section comprising:

a first transmit/receive switch coupled to the first antenna and a second transmit/receive switch coupled to the second antenna, wherein the first and second transmit/receive switches each comprise an antenna terminal coupled to the first and second antenna, respectively, a receive output terminal and a transmit input terminal, the transmit input terminals of the first and second transmit/receive switches being coupled to the output of the first and second transmitter circuits, respectively, wherein the first and second transmit/receive switches are configured to respond to a control signal to select one of the two output terminals; and

first and second bandpass filters, the first bandpass filter coupled to the

receive output terminal of the first transmit/receive switch and the second bandpass filter coupled to the receive output terminal of the second transmit/receive switch, the first and second bandpass filters configured to filter the signals detected by the first and second antennas, respectively, to produce the first and second receive signals.

44. (Previously Presented) The combination of claim 43, wherein the first and second bandpass filters are dedicated to filter signals in a first radio frequency band, and further comprising:

third and fourth bandpass filters dedicated to filter signals in a second radio frequency band;

first and second band select switches, the first and second band selection switches having an input terminal coupled to the receive output terminals of the first and second transmit/receive switches, respectively, and each having a first output terminal coupled to the first and second bandpass filters, respectively, and a second output terminal coupled to the third and fourth bandpass filters, respectively.

45. (Previously Presented) The combination of claim 44, wherein the radio front-end section further comprises third and fourth band select switches, each having first and second input terminals, and an output terminal, the output terminal of the third and fourth band select switches being coupled to the transmit input terminals of the first and second transmit/receive switches.

46. (Previously Presented) The combination of claim 45, wherein the radio front-end section further comprises first and second lowpass filters dedicated to filter signals to be transmitted in the first radio frequency band, the outputs of

the first and second lowpass filters being connected to the first input terminals of the third and fourth band select switches, respectively, and third and fourth lowpass filters dedicated to filtering signals to be transmitted in the second radio frequency band, the outputs of the third and fourth lowpass filters being connected to the second input terminals of the third and fourth band select switches.

47. (Previously Presented) In combination, the radio transceiver of claim 30, and a radio front-end section, wherein the radio front end section comprises a first diplexer coupled to the first antenna and a second diplexer coupled to the second antenna, wherein the first and second diplexers each have first and second branches onto which signals from first and second radio frequency bands, respectively, are coupled for transmission via the first and second antennas, respectively, or are coupled in response to being received by the first and second antennas, respectively.

48. (Previously Presented) The combination of claim 47, wherein for each diplexer, the radio front-end section further comprises a bandpass filter, coupled in the first branch, configured to filter signals received in the first frequency band and a bandpass filter, coupled in the second branch, configured to filter signals received in the second frequency band.

49. (Previously Presented) The combination of claim 48, wherein the radio-front end section further comprises a transmit/receive switch coupled to the bandpass filter in each of the first and second branches for each diplexer, wherein the transmit/receive switch is configured to select either a signal to be transmitted through an antenna coupled to the associated diplexer, or a signal detected by an

antenna coupled to the associated diplexer that is coupled to the bandpass filter for that branch.

50. (Previously Presented) The combination of claim 48, wherein the radio transceiver further comprises a transmit/receive switch coupled to the bandpass filter in each of the first and second branches for each diplexer, wherein the transmit/receive switch is configured to select either a signal to be transmitted through an antenna coupled to the associated diplexer, or a signal detected by an antenna coupled to the associated diplexer that is coupled to the bandpass filter for that branch.

51. (Previously Presented) The combination of claim 50, wherein the radio front-end section further comprises a quarter wavelength element coupled between the transmit/receive switch and the bandpass filter in each of the first and second branches for each diplexer.

52. (Previously Presented) The radio transceiver of claim 43, wherein the transceiver is a single band or a multi-band transceiver.

53. (Currently Amended) The radio transceiver of claim 43, wherein the transceiver operates in time division duplex (TDD), frequency division duplex (FDD), or HFDD (hybrid FDD) mode.

54. (Previously Presented) A method for radio communication comprising:

coupling first and second radio frequency signals detected by first and second antennas to first and second receiver circuits on an integrated circuit;

downconverting the first and second radio signals from a common center frequency with the first and second receiver circuits to produce first and second baseband signals;

coupling first and second baseband transmit signals to first and second transmitter circuits, respectively, on the integrated circuit;

upconverting the first and second baseband transmit signals with the first and second transmitter circuits to produce first and second transmit radio frequency signals at a common center frequency;

coupling the first and second transmit radio frequency signals to the first and second antennas, respectively, for simultaneous transmission;

amplifying the first radio frequency signal using a first power amplifier;

amplifying the second radio frequency signal using a second power amplifier; and

filtering the first and second radio frequency signals using a first and second filter, wherein the first filter is shared by the first transmitter circuit and first receiver circuit, and the second filter is shared by the second transmitter circuit and second receiver circuit.

55. (Currently Amended) A radio transmitter integrated on a single semiconductor integrated circuit, comprising:

at least a first filter, including an input and an output and shared by ~~the~~ a first transmitter circuit and a first receiver circuit, configured to filter either ~~the~~ a first baseband transmit signal that is output to the first transmitter circuit or to filter ~~the~~ a first baseband signal produced by ~~the~~ a first receiver circuit;

at least a second filter, including an input and an output, and shared

by ~~the~~ a second transmitter circuit and a second receiver circuit, configured to filter either ~~the~~ a second baseband transmit signal that is output to the second transmitter circuit or to filter ~~the~~ a second baseband signal produced by the second receiver circuit;

~~a~~ the first transmitter circuit configured to upconvert ~~a~~ the first baseband signal, wherein the first transmitter circuit comprises a first power amplifier, and wherein an output power of the first power amplifier is reduced;

~~a~~ the second transmitter circuit configured to upconvert ~~a~~ the second baseband signal, wherein the second transmitter circuit comprises a second power amplifier, and wherein an output of the second power amplifier is reduced; and

wherein the first and second transmitter circuits are configured to transmit substantially simultaneously.